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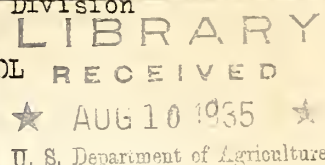
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U. S. DEPARTMENT OF AGRICULTURE  
Bureau of Animal Industry - Animal Husbandry Division

## CLASSIFICATION, GRADES AND USES OF WOOL

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Sheep produce both wool and meat and are therefore dual-purpose animals of importance to the human family both for clothing and for food. Wool is the most important of the animal fibers in point of its widespread and varied usage and the quantity consumed. In appearance, it differs from hair in that it shows "crimp" instead of "curl". Crimp is the name applied to the natural waviness of wool fiber.

Wool is particularly valuable fiber for the manufacturing of cloth because of its elasticity and scaly exterior. The scales, called serrations, are very pronounced in wool and make possible the clinging together, or "felting" of the wool fibers. Their elasticity and the interlocking of their sawlike edges make possible an endless continuation of fibers to form a strand when the fibers are twisted in the process of spinning into yarn.

There are numerous breeds of sheep, some of which have been developed for the growing of wool and others for meat production. It is possible to group these breeds into three classes according to the length and fineness of the wool fibers which they produce: Fine (short), medium and long. A general classification is possible both for fineness and for length of fiber, since the finer wools are usually shorter and the coarser wools longer.

The better known breeds of sheep, in this country, are listed alphabetically below in the three classes just described.

General Classification of Breeds of sheep  
from Wool Standpoint.

Fine wool	Medium wool	Long (coarse) wool
Merino	Cheviot	Cotswold
Rambouillet	Corriedale	Leicester
	Dorset	Lincoln
	Hampshire	Romney Marsh
	Oxford	
	Shropshire	
	Southdown	
	Suffolk	
	Tunis	

The Significance of Fineness of Fiber

Fineness has been used in the tabulation above as one of the distinguishing factors in classifying sheep as wool producers. This is because of its importance in connection with the manufacturing of wool into cloth. Ordinarily, the finer the wool is, the more yards of yarn it will spin per pound.

The factor of fineness is the basis of the English system of grading known as the "Bradford spinning count system" which groups wool according to the number of hanks of yarn it will spin to the pound of clean wool, a hank being 560 yards. The range from fine to coarse wool is approximately 80 hanks that can be spun from a pound of the finest wool to 36 hanks from a pound of the coarsest. These grades are briefly described as 80's, 36's, etc., when expressed numerically. The Bradford system is essentially the same as the numerical expression of the official wool-grade standards of the United States.

The numerical grades of wool are more commonly known in the United States by grade names, as shown in the following tabulation. The term "blood", as used here, is a wool-grade term and has no reference to breeding.

<u>Numerical Grades and Equivalent Wool-Trade Names</u>	
<u>Numerical grades</u>	<u>Wool-trade grade names</u>
<u>(Bradford spinning counts)</u>	<u>(United States)</u>
64's, 70's and 80's	- - - - - Fine
58's and 60's	- - - - - Half blood
56's	- - - - - Three-eighths blood
48's and 50's	- - - - - Quarter blood
46's	- - - - - Low quarter blood
44's	- - - - - Common
36's and 40's	- - - - - Braid

The term half blood describes the coarse side of fine wool; three-eighths blood is the fine side of medium wool; quarter blood is the coarse side of medium wool; low quarter is on the fine side of coarse wool; while common and braid are strictly coarse wool.

Considering the above grades of wool in relation to the general classification of breeds of sheep from the wool standpoint, it may be said that:

The fine-wool breeds usually produce the wool grading 58's and finer, that is, the fine and half-blood wools.

The medium wool breeds produce, usually, wool grading 56's to 48's, that is, the three-eighths and quarter blood wool.

The long wool breeds usually produce wool grading 46's and coarser, or the low quarter blood, common and braid.

#### The Significance of the Length of Wool Fiber

It has been mentioned that greater fineness in wool fibers is associated with less length of wool and coarseness with greater length. Because of this relationship between fineness and length, it follows that

the medium wool breeds produce wool that is generally longer than that of the fine-wool breeds and shorter than that of the long-wool breeds. The fine-wool breeds produce wool approximately 1 1/2 to 3 inches long for one year's growth; the medium-wool breeds produce wool that usually measures from 2 1/2 to 5 inches; and the coarse wool breeds may grow wool as long as or longer than 5 to 8 inches in one year.

From the manufacturing standpoint, the use of wool is also dependent upon its length because long wool will spin to a higher count than short, if the length is not offset by an accompanying coarseness, or weakness, of fiber. Wool is therefore classified from the length standpoint by manufacturers as follows:

Combing wools

This term is applied to the longer wools - 2 1/2 inches or more being usually required for successful combing. These combed fibers are used in making worsted yarn. Only the longer straightened fibers are used and these are placed parallel in the yarn. Combing wool requires strength as well as length in order to stand the combing process. Worsted yarn is smooth and lustrous.

Clothing wools

This term applies to the shorter wools which are used in the manufacture of woolens and felts. The fibers are laid in every direction instead of parallel, making possible the use of "noils", which are the short and tangled fibers left from the combing process. Woolen yarn is generally rough and lusterless.

Baby or French  
combing

This is a type of wool about half way between combing and clothing wools in length.

Carpet wools

These are coarse <sup>long</sup>wools, resembling hair.

"Worsteds" is the term applied to fine-wool fabrics such as serges and twills - in fact any fabric made from worsted yarn.

"Woolens" is the term applied to such fabrics as broadcloth and flannel - any fabric made from woolen yarn.

In the manufacture of both woolens and worsteds the weight of finished cloth is much less than the weight of the wool originally used. There are losses all along the way in the manufacturing process. An average of about 3.7 pounds of fine grease wool or 1.37 pounds of scoured (washed) wool is required to make a pound of woolen cloth. An average of about 3.66 pounds of medium grease wool or about 1.55 pounds of scoured wool is required to make a pound of worsted cloth.



Scouring is the source of greatest loss. Fine wools will ordinarily lose from 50 to 60 percent in weight and medium wools from 40 to 50 percent. Wool should be washed in lukewarm water and rinsed at the same temperature. Hard wringing or rubbing of wool should be avoided as it causes the wool to mat together ("felt") and causes fabrics to shrink and change their shape.

### Preparation of Wool for Cloth

There are seven main steps in the preparation of wool for cloth.

The first is the growing of good wool. This is achieved by proper feeding, handling, and breeding. Good wool should have uniformity of diameter of fiber, strength, uniformity of color, luster, and reasonable cleanliness.

The second step is the shearing of the wool from the sheep. This is usually done by machine and should be done on a clean floor. The shorn fleece should be tied flesh side out with paper twine.

The third step is "sorting" the wool, that is, dividing it into lots according to fineness, length, character, color and spinning qualities.

The fourth step is "scouring", which has been previously mentioned.

The fifth step is the removal of burrs and other foreign matter.

The sixth step is "carding", that is, passing the wool through a carding machine, a large iron frame on which are a series of iron rollers covered with leather in which slightly bent wire teeth are set. The wool is passed from roller to roller and is finally reduced to the size of untwisted yarn.

The seventh step in the case of woollens is the spinning operation which twists the fibers together giving them strength and making them into yarn.

In the case of worsteds, there is a combing operation which passes the wool through circular combs. In this process the fibers are laid parallel. The combs separate and draw off the long fibers called "tops" in a continuous length. The remaining short fibers are called "noils."

Table of wool classifications

The following is a list, grouped according to fineness of wool, of the more common breeds of sheep, together with a description of the kind of wool each produces and the uses to which it can be put in the manufacture of cloth.

	: American	: Numerical	:
	: Grades of	: Grades of	:
Breeds	: Wool	: Wool	: Uses
Merino and	: Fine and half-	:	: Used in making fine
Rambouillet	: blood	: 58's and finer	: dress goods and flannel
	: Half and three-	: 58's and 60's	: The half-blood wool is used
	: eighths blood	: in the half	: mostly for fine dress goods.
	: combing and cloth-	: blood. 56's in	: The three-eighths blood for
Southdown	: ing (chiefly three-	: the three-eighths	: the manufacture of cloth suc
	: eighths blood	: blood.	: as serges, twills, whipcords,
	: clothing).	:	: herringbones and other mater-
	:	:	: ials used for coatings and
	:	:	: suitings.
	: Mainly three-	:	:
Corriedale	: eighths blood comb-	: 56's in the	:
Dorset	: ing or clothing and	: three-eighths	:
Hampshire	: some quarter blood	: blood.	: Used mostly in the manufac-
Shropshire	: (both fine and	: 48's and 50's in	: ture of suitings.
Suffolk	: coarse classes of	: the quarter	:
	: medium wool).	: blood.	:
	: Usually quarter	:	:
	: blood combing	:	:
Cheviot	: (that is, the	: 48's and 50's	: Used mostly in the manufac-
	: coarse side of	:	: ture of suitings.
	: medium wool).	:	:
	: Quarter blood	:	: The quarter blood is used in
	: and low quarter	:	: the manufacturing of suitings
	: blood combing	:	: and the low quarter blood is
Oxford	: (that is the	: 46's and 48's	: used in making such materials
	: coarse side of	:	: heavy overcoats, blankets,
	: medium and the fine:	:	: and carpets.
	: side of coarse wool:	:	:
	: Low quarter blood,	: Chiefly 46's	:
Cotswold	: common and braid.	: 44's, 40's and	: Used mostly in the manufac-
Leicester	:	: 36's. A small per-	: ture of heavy overcoatings,
Lincoln	:	: centage produce	: blankets, and carpets.
Romney	:	: finer than 46's.	:

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